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1100 Seventeenth Street, N.W. Washington, D.C. 20036

SUBJECT: Trip Report - Visit to Vandenberg AFB to Discuss Launch Azimuth Limits for WTR - Case 720

DATE: March 8, 1968

FROM: H. S. London
J. J. Schoch

ABSTRACT

The minimum launch azimuth currently permitted from WTR is approximately 169°. This limit is set by hazard to the immediate area of Vandenberg Air Force Base, the town of Lompoc, and Jalama beach. It appears that such hazard will be considerably reduced when launches take place from SLC-6, the Titan IIIM/MOL facility, due to its more southerly location. As a consequence, more easterly launch azimuths may be permissible. Overflight of the offshore islands south of Vandenberg AFB is not a restriction.

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MEMORANDUM FOR FILE

The authors visited Vandenberg AFB on February 13, 1968 to discuss azimuth limits for southeasterly launches from the Western Test Range. Prior to discussions with people from Range Safety, the authors were shown two launch complexes: Space Launch Complex 6, now under construction, which is to be used for MOL launches and Space Launch Complex 4 which is used for present Titan IIIB and future IIID launches.

Following the visit to the space launch complexes, the authors met Messrs. R. Geisinger, D. M. Benn and Col. Wallis, all of the Range Safety Office. The discussions that followed are summarized below.

The most easterly azimuth currently permitted from operational launch facilities is about 169°. This limit is set by hazard to the immediate area of the Vandenberg launch facilities, the industrial area of Lompoc and the Jalama state park resulting from the possibility of offshore winds blowing debris into these areas. Complete range safety analyses have been carried out for launches from SLC-3 (Atlas/Agena and Thorad launch facilities) and 4 on azimuths as easterly as 145°; the Air Force Systems Command has not yet approved any such missions, however.

No analyses have been completed to date for launch from SLC-6. However, it appears that the location of this facility is more favorable to southeasterly launches than those of the other launch complexes at Vandenberg AFB. SLC-6 is the most southerly located complex, situated at approximately the same latitude as Point Arguello and less than 2 miles from the seashore both in the southern and western directions (see attached Figure 1). Because of its location there is less hazard to the Vandenberg-Lompoc area than at other complexes, and much of the hazard will be during the initial lift-off phase and therefore independent of launch azimuth. The main danger to life is the proximity of the flight path to Jalama park, which presently is just a beach, but will soon have overnight camping facilities. There is a possibility of substantial commercial development in the Cojo area within the next few years. However, the nominal flight path from SLC-6 misses Jalama by several miles even

when launched at 145° azimuth, whereas from SLC-3 or SLC-4 it would pass almost directly over Jalama and Point Concepcion. It is quite possible therefore that more easterly launch azimuths can be tolerated from SLC-6, the Titan IIIM/MOL facility, than from the more northerly located launch facilities. Detailed range safety analyses are required, however, to confirm such conjecture and establish the most easterly permissible launch.

Range Safety utilizes a computer program that takes as input the nominal trajectory of a vehicle launched at a certain azimuth, the possible turning rate of the vehicle, some standard wind condition, and a certain statistical distribution of fragments into which the vehicle could break up, each having its own ballistic coefficient. Output of this program is a contour map showing contours of probability of hitting certain geographical locations, and "kill" probabilities based on local population density. This data assist the commanding officer of WTR in deciding whether or not to permit a launch at a certain azimuth.

With regard to overflying land there is no concern with the offshore islands south of Vandenberg AFB (see Reference 1).* The Island of San Miguel is not inhabited and belongs to the Federal Government, Santa Rosa is very scarcely populated and only used for grazing cattle, and San Nicolas is a tracking station with only 10 or 15 men on it.

Colonel Wallis emphasized that Range Safety's concern is not limited to the inhabited areas only, but that it has to look out for the astronauts' safety. On unmanned Titan IIIC & D. flights there is a destruct system which can break up the solids into smaller parts. He feels that it would be dangerous to have such a destruct system aboard a manned flight. However, he is not convinced that the solid rocket motor falling on the ground in one piece would necessarily be a larger fire hazard than if broken up in little pieces. Brush fire danger is a very real problem around Vandenberg and adjacent canyons, and consequently the fire hazard from a destructed rocket is regarded seriously.

H. S. London

J. J. Schoch

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Attachment

*Schoch, J. J., "Launch Azimuths from the Pacific Missile Range, Case 720", Bellcomm Memorandum for File dated February 28, 1968.

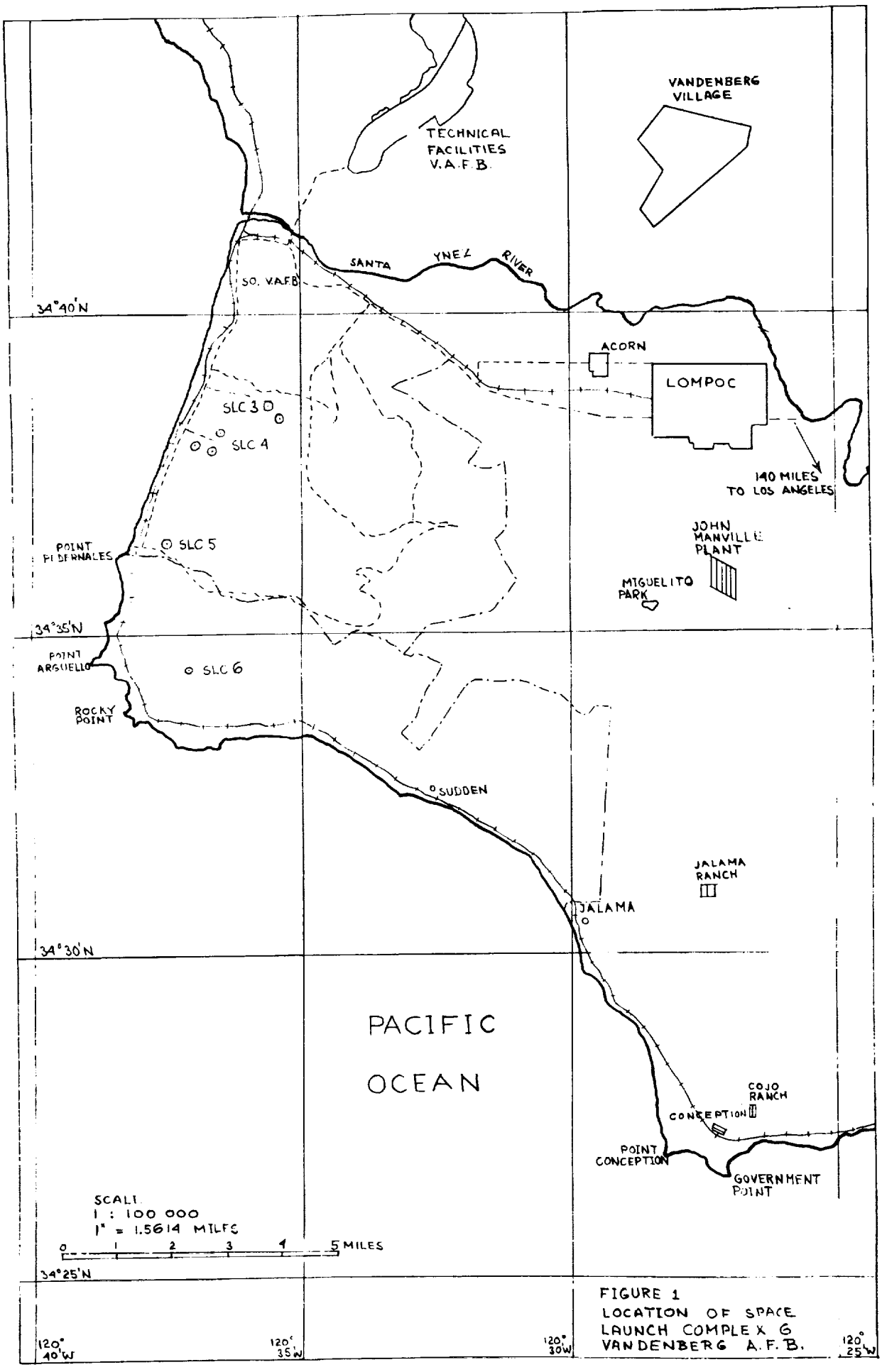

FIGURE 1
LOCATION OF SPACE LAUNCH COMPLEX 6 VANDENBERG A.F.B.

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